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Economic Recovery from the Argentine Great Depression: Institutions, Expectations, and the Change of Macroeconomic Regime

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"Economic Recovery from the Argentine Great Depression: Institutions, Expectations, and the Change of Macroeconomic Regime* "

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Abstract : This work explores how Argentina overcame the Great Depression and asks whether active macroeconomic interventions made any contribution to the recovery. In particular, we study Argentine macroeconomic policy as it deviated from gold-standard orthodoxy after the final suspension of convertibility in 1929. As elsewhere, fiscal policy in Argentina was conservative, and had little power to smooth output. Monetary policy became heterodox after 1929. The first and most important stage of institutional change took place with the switch from a metallic monetary regime to a fiduciary regime in 1931; the *Caja de Conversión* (Conversion Office, a currency board) began rediscounting as a means to sterilize gold outflows and avoid deflationary pressures, thus breaking from orthodox "rules of the game." However, the actual injections of liquidity were small, and were not enough to fully offset the incipient monetary contractions: the "Keynes" effect was weak or negative. Rather, recovery derived from changes in beliefs and expectations surrounding the shift in the monetary and exchange-rate regime, and the delinking of gold flows and the money base. Agents perceived a new regime, as shown by the path of consumption, investment, and estimated *ex ante* real interest rates: the "Mundell" effect was dominant. Notably, this change of regime predated a later, and supposedly more significant, stage of institutional reform, namely the creation of the central bank in 1935. Still, the extent of intervention was weak, and insufficient to fully offset external shocks to prices and money. Argentine macropolicy was heterodox in terms of the change of regime, but still conservative in terms of the tentative scope of the measures taken.

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Introduction

The experience of Argentina during the Great Depression provides an ideal historical laboratory for the investigation of macroeconomic stability and policy choice in a small open economy under a fixed exchange rate regime. Given recent developing country experiences in Latin America and Asia, including examples of contemporary monetary regimes with currency boards very similar to Argentina's institutions of the early twentieth century, there is considerable topical interest in these questions. The essential questions is: what happens if you employ a currency board and there is an external crash or deflation threat? This was the nature of the crisis in the 1930s for many countries, and the same potential problem faces Argentina, Hong Kong, and other countries in the 1990s. What should they do today? To inform that question we ask: What did Argentina do in the past?

The Great Depression began in Argentina in the late 1920s, even before the traditional date for the onset of the Depression in the core, the Wall Street crash of 1929. Like many countries of the periphery, Argentina was exposed to the commodity lottery. As Díaz Alejandro (1983) and Kindleberger (1986) have noted, this exposure led to macroeconomic fortunes collapsing as the terms of trade worsened through the 1920s. By December 1929, the balance of payments crisis was severe, and the exchange rate was allowed to float after a mere two-year resumption of the gold standard. But this was not a decisive break from macroeconomic orthodoxy. Fiscal policies remained conservative under Uriburu, and, even more than in other countries like the United States; we even find evidence of fiscal tightening just as the worst of the Depression hit during 1929–31 (Ortíz 1993).

Recovery began in 1931, as output grew for the first time in several years, and by 1934-35, output had regained its 1929 level. We show that assigning fiscal policy any responsibility for this recovery is implausible: by any measure fiscal policy actually *tightened* during the early 1930s, as in many other Latin American countries, and as in the United States. Orthodoxy in fiscal policy was not an immediate casualty of the change in regime. Thus we move on to examine monetary policy actions from 1929 to 1935, seeking for evidence of a change of regime. Although many commentators would see the creation of the *Banco Central* (Central Bank) in 1935, according to Federico Pinedo's plan, as the main monetary policy event of the 1930s in Argentina, we instead emphasize the remarkable decision of the *Caja de Conversión* (Conversion Office, a currency board) to began rediscounting and so forge an independent monetary policy, as early as 1931, at the urging of Raúl Prebisch. This decision to sterilize gold losses to offset monetary contractions was the decisive break with the old orthodoxy. In many ways, the later creation of the Central Bank merely rubber-stamped the operations of this new macroeconomic policy regime, and continued these

operations after 1935.[1] But the Argentine recovery was complete by 1935; and the only pre-1935 change in regime that could be assigned a role in ending the Argentine Great Depression was the change in ideas at the Conversion Office. Yet, did it make a difference?

To investigate the question, we conduct an econometric analysis of prices, exchange rates, and interest rates. We find that the change of monetary regime was essential to Argentina's recovery in that it helped avert a devastating collapse of prices, and, potentially, of output in 1931–33. Instead of following the United States and other countries into this abyss, Argentina's regime shift destroyed deflationary expectations, permanently lowering previously extremely high real interest rates. In other ways, though, policy was still limited by orthodox thinking. Sterilizations offset gold outflows to a large degree, but never counteracted them to any great degree: indeed the money base barely changed from 1929 to 1935, though at least it didn't shrink as much as orthodoxy would have required. So there was no "Keynes" effect at work, no large money injection to stimulate aggregate demand via the money market. In this sense, Argentina was still a prisoner of its intellectual and economic history, and the Conversion Office, though willing to follow Prebisch's plan, was not willing to push it as far as it might to use monetary expansion as a device to end the Depression more quickly. Using monetary policy, it was apparently very hard to break from the constraint of purchasing power parity (PPP) at this stage, so aggregate demand was hard to manipulate.

In the end, the key channel through which the change in monetary regime had real effects was via the destruction of deflationary expectations. With nominal interest rates subject to the zero floor, this change of regime could significantly reduce *ex ante* and *ex post* real interest rates. This was indeed the case, promoting recovery through increases in aggregate demand via investment and consumption activity: the "Mundell" effect of the change in expectations was the vital source of recovery. Hence we think that the institutional change heralded by the rejection of an old orthodoxy was just as essential to recovery from the Great Depression in the periphery as in the core.

Contours of the Argentine Great Depression

The Great Depression marked the end of an epoch where free trade and integration into external capital markets acted as the main recipes to secure economic growth and prosperity for the Latin American Countries (Díaz Alejando 1983, 1984). In important studies, O'Connell (1984) and De Paiva Abreu (1984) noted how the dramatic change in the international economy shaped political-economy views about the welfare enhancing aspects of an outward economic orientation in two of the most important Latin American

[1] In substantive terms, we could argue, the main contribution of the central bank was to put in place a rescue

countries, Brazil and Argentina. In the deteriorating climate for trade in the 1930s, both countries tried to structure bilateral trade agreements with the two world powers, United Kingdom and the United States, with mixed results. The asymmetric bargaining power of the new international economic order took its toll on their domestic economies. For Argentina, although economic problems had retarded economic growth since 1914 (Taylor 1992), there was a pressure to stand by the old liberal orthodoxy. Even during and after the *worst* recession in Argentine history, during World War One, few policymakers seriously questioned the return to orthodoxy as the goal for the 1920s, to rebuild an economic order predicated on openness in markets and adherence to the gold standard as a monetary rule.[2] This view was only broken as the threat of an even worse economic collapse loomed in the early 1930s.

In Table 1, we depict some important macroeconomic data that characterizes the impact of the Great Depression on the Argentine economy. From 1929 to 1932, Argentina imported the severe deflationary pressures in the international economy.[3] The external terms of trade declined by 24% and the trade share, defined as the ratio of the semi-sum of exports and imports to real output went from an all-time high of 36% in the late twenties to a low of 28% in 1932. If one were to judge by its trade exposure, Argentina was one of the most vulnerable economies in the presence of such sizeable foreign shocks—shocks that, in addition to pure deflation, also included fierce terms of trade declines as countries took their hits in the "commodity lottery."[4]

However, it is astonishing is that the Argentine Great Depression was so mild and short-lived by international standards. Hence, the notion that an important change in economic policy took place, and saved Argentina from more pronounced suffering, deserves close scrutiny. As can be gleaned from Table 1, from peak to trough (1929 to 1932), the domestic real output fell by "only" 14% and had even surpassed its 1929 level already by 1935. Deflation, a curse to avoid in the inter-war period, was only about 6% in the 1929-1932 period. The behavior of output and prices compares favorably, say, to North American

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package for the financial sector using the proceeds of gold revaluation.

[2] Though rarely remarked on, this point about the relative size of Argentine recessions bears repeating. We can measure the size of recession by a simple technique, cumulating deviations below the previous peak level of log output over subsequent years, until the previous peak is surpassed, and measuring the cumulative loss as a fraction of annual output. Using this yardstick, the three largest recessions of the period from 1884 (the start of annual output data) to 1940 are the Baring Crisis of the years 1890–93 (4 years, cumulative loss 31%), the recession of 1914–19 (6 years, 63%), and the Great Depression of 1930–34 (5 years, 43%). See della Paolera and Taylor (1998).

[3] On these deflations, see Kindleberger (1986); Temin (1989); Eichengreen (1992a).

[4] On the commodity lottery see Díaz Alejandro (1984). For a discussion of the general experience of the periphery in the 1920s with terms-of-trade shocks see Kindleberger (1986).

gold-standard countries such as the United States and Canada: they had an overall decline in real activity of more than 30% from peak to trough, and a decline in their price level of more than 20%.[5]

[5] The data are from Mitchell (1992; 1993).

Table 1
Contours of the Argentine Great Depression

(a) Nominal Variables

	Money Base			Money		General		Land	Banks'
	Total (M0) m $mn	Gold Stock m $mn	Domestic Credit m $mn	Supply (M3) m $mn	Exchange Rate $mn/$US	Price Level 1913=100	Wage Level 1913=100	Price Level 1913=100	Discount Rate %
1913	823	530	293	1,687	2.35	100	100	100	5.4
1928	1,406	1,113	293	4,717	2.32	131	180	296	6.3
1929	1,247	954	293	4,652	2.35	127	178	293	6.9
1930	1,261	968	293	4,660	2.70	122	166	238	6.9
1931	1,245	593	652	4,149	3.40	118	155	260	7.2
1932	1,339	584	755	4,116	3.83	119	146	237	7.1
1933	1,214	561	653	4,061	3.18	114	139	210	6.1
1934	1,172	561	610	4,078	3.89	130	136	196	5.5
1935	1,647	1,354*	293†	4,180	3.75	128	147	185	5.4
1936	1,685	1,528*	157†	4,611	3.55	131	153	217	5.6
1937	1,679	1,422*	257†	4,922	3.28	150	159	252	5.2
1938	1,615	1,296*	319†	4,811	3.86	140	160	271	5.3
1939	1,796	1,396*	400†	4,960	4.27	143	166	256	5.8
1940	1,810	1,329*	481†	5,050	4.30	163	176	248	5.8

(b) Real Variables

	Terms of Trade 1913=100	Real Exchange Rate 1913=100	Components of GNP millions of $mn 1913						Consolidated Government Deficit/GDP %
			Output Q	Priv. Con. C	Gov. Con. G	Investmt. I	Exports X	Imports M	
1913	100	100	4,640	4,322	204	579	1,805	2,270	0.8
1928	99	121	7,780	6,549	406	900	2,901	2,991	1.7
1929	90	126	8,146	6,781	425	1,029	2,847	3,048	2.3
1930	88	144	7,784	6,829	408	871	2,100	2,533	4.3
1931	65	165	7,216	5,248	393	533	2,871	1,651	2.7
1932	68	162	6,966	5,092	393	374	2,636	1,282	1.8
1933	64	139	7,309	5,723	415	418	2,474	1,506	1.7
1934	79	159	7,912	6,085	447	554	2,546	1,584	1.8
1935	79	153	8,275	6,187	538	691	2,754	1,836	1.2
1936	96	148	8,336	6,249	565	824	2,491	1,870	1.7
1937	110	121	8,964	7,145	612	748	2,911	2,381	2.4
1938	101	151	8,979	7,703	634	824	1,963	2,251	2.4
1939	89	162	9,337	7,271	668	691	2,501	1,755	3.6
1940	91	145	9,486	7,588	672	637	2,071	1,461	2.7

† Domestic Credit is defined as after 1935 as money base minus revalued gold minus reserves.
* After 1935 gold reserves were revalued when official par changed from 2.27 to 4.96 paper pesos per gold peso.
Source: della Paolera and Taylor (1998).

The Argentine performance is also very good by the standards of the periphery. Other Latin American countries were much more affected by the downturn. In the same 1929–32 period, Mexico's prices and output fell by 19%, Chile's real output by 27%, and Brazil's by 28%. Here it is interesting to note that the mere presence of currency depreciations of important magnitude is not directly related to the extent of the experienced depression. For example, in Brazil there was a 66% depreciation of its currency, in Mexico 47%, while the Argentine paper peso declined by 63% with respect to the gold dollar.

Thus, it is important here to distinguish between those currency depreciations that were part of a change in the macroeconomic regime and others that merely reflected typical foreign exchange market pressure in an inconvertible regime during a severe downturn in the balance of payments. As we shall see later for the Argentine case, there is an enormous difference between: (a) just letting the currency depreciate as a mean to restore equilibrium in the money market; and (b) installing a new policy regime *à la* Sargent (1983) that will influence expectations and hence alter the course of economic decisions. The distinction is between a country ***choosing*** to depreciate as part of a regime switch versus ***being forced*** to depreciate whilst adhering to orthodoxy. This was recognized by della Paolera and Ortiz (1995): "...the 1931 year, however, was without doubt a peculiar one: the year started with the combination of an extremely orthodox domestic fiscal policy and an unequivocal convergence towards a fiduciary monetary system...". In other words, if she were free to choose to effect a full-fledged change in her monetary regime, as a proactive political economy decision, Argentina must have had a lot of room for maneuver. Indeed she did: years of orthodox adherence to the gold standard had led to a massive build up of gold reserves, and an enormous backing for the domestic currency.

From Table 1 we note that around 1930, almost 80% of the money base was backed with gold. The inelastic relationship between gold and money finally broke in 1931 when the government decided to switch from targeting the gold reserves backing the quantity of money to targeting the nominal quantity of money itself. In this manner, the Argentine authorities halted a decline in the quantity of money in a bid to avert deflation. The gold stock was critical. The use of gold for fiscal purposes, to service external debt obligations, allowed the government to maintain a very orthodox fiscal policy by using these tied-up resources; thus did Argentina escape default on foreign debts in the 1930s, a very unusual feat for a peripheral country. So the new policy mix was chosen: sound finance in the realm of fiscal affairs, and, at the same time, an unorthodox fiduciary monetary regime. In 1931 and 1932, the domestic credit component of the money base, frozen at 293 million pesos for 32 years, increased to such an extent that it already accounted for 62% of the money base by 1932.

Other macroeconomic responses stand out in Table 1. Investment fell by about one half in 1929–31, then by another third in 1932. Private consumption fell by about a quarter. Both shifts greatly exceeded the fall in output. One can understand the perceived need to implement some change in policies to redress the negative expectations that prevailed. The banks' interest rate was pretty flat at around 7%, so an injection of liquidity could perhaps ease the credit market via the "Keynes effect." But most of the effort to change expectations had to come through the "Mundell effect"—the destruction of deflationary expectations.[6]

For Argentina, it might be observed that the dramatic declines in output, investment, and consumption ceased, and then reversed, after 1932 (Table 1). The evolution of the real exchange rate suggests that the authorities were successful in the regime change, and were able to anchor the real exchange rate in spite of the sizeable deterioration in the terms of trade. Export growth and sustained import compression assisted recovery. In short, by 1933 Argentina had circumvented the most devastating effects of the World Depression.[7] Did policy choices make a difference? In the next section we examine the features of Argentine fiscal and monetary policies.

The Interwar Gold Standard: Orthodoxy and Heterodoxy

In important studies, Díaz Alejandro (1983) and Ortiz (1993) have characterized the Argentine Great Depression as a definite "blessing"—in the sense of creating an opportunity to adopt new economic policies and institutions. This new institutional regime, by deviating from the prevailing *mentalité* of the orthodox gold standard, could insulate the domestic economy from the dismal global scenario.[8] Such a reaction was hard to envisage just a few years earlier. In this section we discuss Argentina's position as a small open economy at the periphery and her struggle, over more than a century, to securely establish credible monetary, fiscal, and financial institutions. This effort followed from a political consensus in which few seriously doubted the rewards that would (and did) accrue to Argentina in return for embracing globalization in the late nineteenth century and playing by the "rules of the game" as laid down by private

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[6] Temin (1989) noted the impact of these two effects in the 1930s recovery in the core countries, and he too stressed the importance of the Mundell effect and the change of expectations that followed the change of regime (see also Eichengreen 1992a; 1992b). The U.S. experience under Hoover and then FDR is a classic example of such a regime shift (Temin and Wigmore 1990; also Romer 1992).

[7] See however the impact on the economy of weak financial institutions in della Paolera and Taylor (1997)

[8] Diaz Alejandro (1983) states: "...Once upon a time foreign money doctors roamed Latin America prescribing fixed exchange rates and passive gold exchange standard monetary rules. Bankers followed in their footsteps, from the halls of Montezuma to the shores of Daiquiri...This paper will chronicle some of the ways

finance and governments in the core: free movements of capital, labor, and goods were a key ingredient in Argentina's pre-1914 success. Against this backdrop, and despite the instability in the global economy after 1914, it should still be apparent what extraordinary intellectual and technocratic obstacles policymakers had to surmount in the 1930s before they could effect a radical change in the macroeconomic regime, and depart from the prevailing orthodoxy even ahead of most of the developed countries of the core. In this context, the timing and depth of institutional changes are crucial to determine when and how policy actions modified behavior and expectations in the domestic economy, and we therefore spend some time surveying the evolution of fiscal and monetary policies.

Fiscal Policy

Whereas the above discussion highlights the changing context of monetary policy over the 1930s, the historical record shows no similar evolution towards an interventionist stance in the sphere of fiscal policy. As we shall show presently, Argentina's basic orthodox fiscal stance, of seeking to maintain budget balance, was conserved even during the worst years of the Great Depression. For a number of reasons we should not consider this outcome surprising.

First, even in the economies of the core, the power of fiscal policy was not fully unleashed to insulate economies from the recession. Thus, for example, the classic Keynesian tool of macroeconomic management did not fail, but rather was never really used, as was famously pointed out by Brown (1956).[9] Simply put, for all the fanfare about the impact of New Deal spending programs, it was hard to find any evidence of *full employment* deficits in the U.S. in the 1930s. Indeed, for many years, the net fiscal impact appeared to be even slightly contractionary.

Second, even if fiscal activism was an option for core countries in the 1930s, with their developed taxation systems and fiscal sophistication, it was likely to be much less of a feasible policy choice for countries at the periphery. Peripheral countries simply had much less developed government structures for managing, administering, and implementing large spending programs. This was the case throughout Latin America, for example, where Twomey (1983) discovered that few countries in the 1930s were capable of developing new fiscal programs in response to the Great Depression.

There is no strong prior reason to expect Argentina to deviate from this more general pattern. Argentina had kept up a much more rigid historical adherence to orthodoxy and the "rules of the game"

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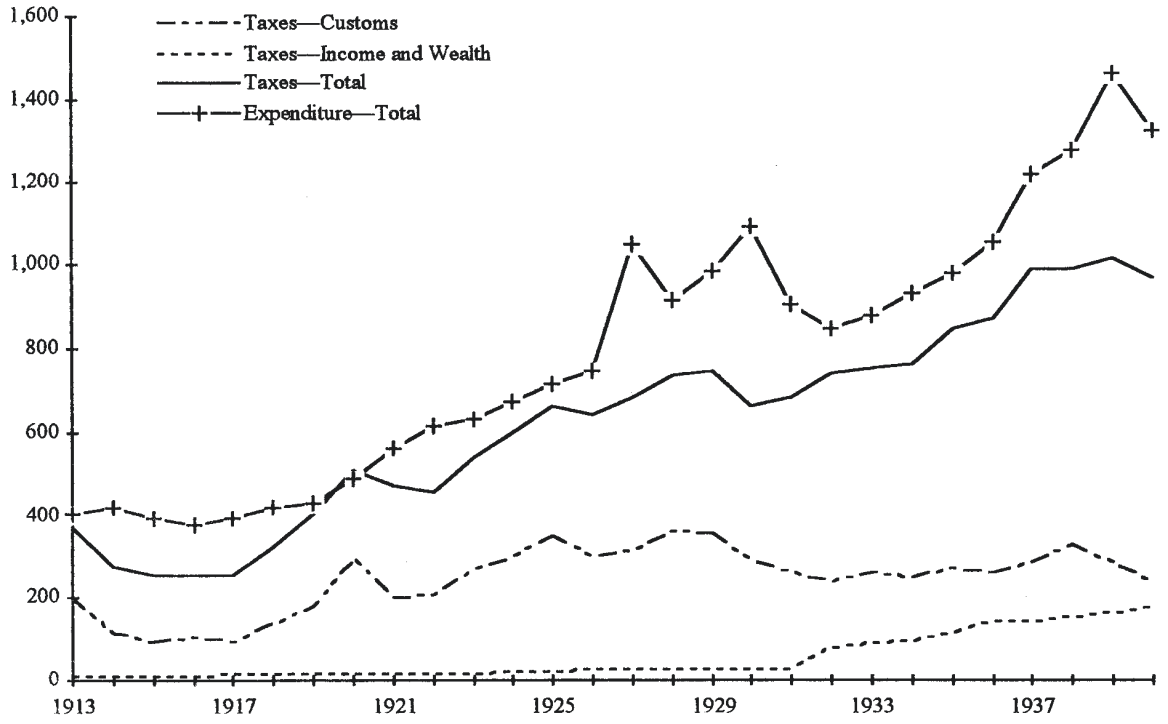
various Latin American economies coped with them. It will be seen that the performance of several [Latin American] economies was remarkably good , under the circumstances..."

[9] This finding was further reinforced by the work of Peppers (1973) and Romer (1992).

Figure 1
Argentine Fiscal Policy



Notes: Units are millions of paper pesos.
Source: Mitchell (1993).

under the classical gold standard. This was in an attempt to win credibility from core countries, gain access to foreign capital (successfully), and pursue a greater degree of macroeconomic stability than other countries in the region. Thus, there is, arguably, every reason to expect Argentina to have been even more fiscally orthodox than her neighbors up to and even during the 1930s. The 1930s fiscal experience in Argentina more or less accords with expectations:

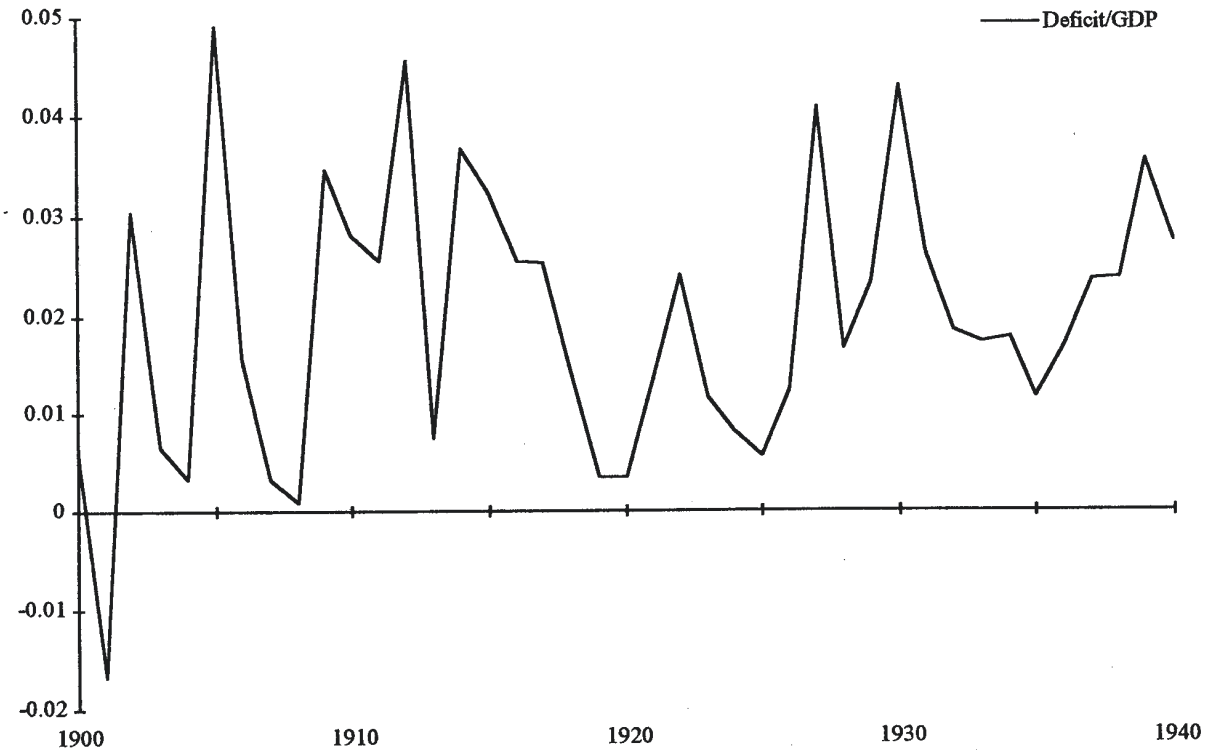
> Tax revenues lagged behind expenditures during President Yrigoyen's administration; in 1930 nominal tax revenues, heavily dependent on import duties, fell in absolute amounts....Large deficits were registered in 1930 and 1931, which could be regarded as being induced by the decline in foreign trade rather than as autonomous acts of policy....As in other Latin American countries fiscal heterodoxy was discredited in Argentina by lax budgets during the late 1920s. Both the Uriburu and the Justo administrations attempted to reduce expenditures and to increase taxes during the early 1930s; an income tax was introduced in 1932 and tariff rates were increased earlier. (Díaz Alejandro 1983, 21)

Various data sources confirm this view. One simple measure is the fiscal action of the central government, shown in Figure 1. It is apparent that at the start of the interwar period customs taxes levied

on imports constituted a large share of revenues, as is typical in all developing countries, accounting for $199 million out of $370 million pesos of tax revenues in 1913, or about 54%. Consequently, tax revenues were likely to be cyclically correlated with trade conditions, and thus general economic conditions, since during recessions, import contraction was a standard response. This is borne out by the data, with dramatic declines in customs taxes during the WWI crisis, in the 1921–22 and 1926 recessions, and, strikingly, after 1929 and throughout the 1930s. As government spending increased more or less on a trend in this period, there was thus some scope for an endogenous (though not, by definition a *full employment*) deficit to appear in these recessions, and indeed temporary deficits were run up in World War One and in 1921–22.

The fiscal response in the 1930s was not so forgiving, as is also shown by Figure 1. High expenditures were run up in 1928–30, but were drastically cut back during 1931–33, generating a big contractionary effect just as the economy fell into the Great Depression. There was no Argentine New Deal as far as central government program expenditure was concerned. At the same time, although customs taxes were falling in line with the trade crisis, *total* taxes were increasing. President Uriburu, like Hoover in the United States, was a fiscal conservative, and was searching for a means to close the fiscal gap, and return closer to an orthodox budget balance. One important part of the package was a dramatic increase in direct taxes, in the form of income and wealth taxes, which rose from a typical level of $25 million pesos (less than 5% of all revenues) in the 1920s, to $92 million (almost 15%) in 1933. With a broad array of aggressive tax programs, the government raised taxes consistently every year after 1930, and closed the deficit from $240 million pesos in 1929, to just $126 million in 1933.

Figure 2
Deficits as a Share of GDP



Source: della Paolera and Taylor (1998).

These conclusions hold up when an appropriately normalized measure of fiscal stance is calculated: we use the ratio of the deficit to GDP. Figure 2 shows this data using information now on the overall consolidated deficits of the entire public sector going back to 1900. Comparing the classical gold standard years with the interwar and even the interventionist years of the 1930s reveals no marked shift in the propensity of the Argentine government to employ deficit finance, or apply fiscal policy as a countercyclical measure. And again, it is apparent that after 1930, fiscal policy so measured became ever more contractionary in both actual, and, thus, even more so, in adjusted full-employment terms.

Far from pursuing expansionary fiscal policy via increased *full employment* deficits, the Argentine fiscal response during the Great Depression was such as to generate not even increases in *actual* deficits, but rather a move toward surplus. We concur with Díaz Alejandro (1983, 22), that "[i]n short, there is no evidence that during the early 1930s the Argentine government sought to increase the full employment budget deficit as a means to compensate for the fall in aggregate demand." The net effect of fiscal actions were, then, surely contractionary, and remained so through at least 1935. The empirical search for a source

of Argentine economic recovery must focus elsewhere, therefore, and as our earlier evidence suggests, must concern itself with the escape from gold-standard orthodoxy embodied in the change in monetary regime.

In fact, fiscal orthodoxy and monetary tensions were two sides of the same coin. Intense fiscal pressure was felt in many Latin American countries in 1929–30. Tax revenues fell and foreign lenders refused to roll over debts in the worsening international climate. Deflations and depreciations raised the burden of foreign-denominated debt service. The deficit for 1930 stood at 4.3% of output, a marked increase from previous years (Table 1). Debt service had risen from 18% of the budget in 1930 to 29% in 1932 Díaz Alejandro (1983, 20–21). Many countries chose to default in this situation, but Argentina never wavered from her external sovereign debt obligations, and here fiscal policy and commercial policy were also tied together. With so much of her trade linked to Britain, and with Britain imposing imperial trade preferences under the Ottawa accord, Argentina was left to plead for some trade concessions from a weak position. She finally obtained unfavorable terms under a mostly bilateral trade deal, the Roca-Runciman pact of 1933 (Díaz Alejandro 1983, 28–29; Salera 1941). So as not to derail this crucial trading pact, Argentina maintained debt service, understanding that British creditors could not be let down or else severe trade penalties might result from a diplomatic crisis.

The fiscal gap could not be closed by default, and attempts to raise tax revenues proved insufficient. The only remaining answer was to activate the last fiscal resource left to the government: the large gold stock sitting idle in the vaults of the Conversion Office. This course was taken, but the price for subscribing to this fiscally orthodox response was to draw down to gold stock and, *ipso facto*, the money base, given the mechanical rules of operation followed at the Conversion Office. Thus a deflationary money contraction was an inevitable but undesirable side-effect of the fiscal course chosen—at least so long as the Conversion Office played by its own rules.

Table 2
Monetary Policy Chronology, 1883–1935

1883	Law of 1881 implemented, establishing gold standard.
1883–1885	Gold standard; par is 1 gold peso = 1 paper peso.
1886–1891	Baring Crisis; inflation leads to collapse of convertibility; exchange rate begins to float and depreciates markedly.
1891–1899	Inconvertible paper currency. Floating exchange rate of paper to gold pesos.
1899	Convertibility law. Creation of *Caja de Conversión* (Conversion Office), a currency board. Currency board exchanges gold for pesos at new par (2.27) for all transactions.
1899–1914	Gold standard; 1 gold peso = 2.27 paper pesos.
1914–1927	Inconvertible paper currency. Floating exchange rate of paper to gold pesos. Gold flows at the Conversion Office limited to occasional government uses. Currency board continues to exchange gold for pesos at new par for these transactions.
1927–1929	Gold standard; 1 gold peso = 2.27 paper peso.
1929–1931	Inconvertible paper currency. Floating exchange rate of paper to gold pesos. Gold flows limited to fiscal uses (payment of government foreign debt). Currency board continues to exchange gold for pesos at new par (2.27) for these transactions.
1931	Currency board deviates from mechanical money creation rule: starts to use rediscounts. Start of independent Argentine monetary policy.
1935	Creation of *Banco Central* (Central Bank). Takes over all assets and liabilities of the Conversion Office. Revalues gold stock according to prevailing market rate of exchange (new par is 4.96 versus 2.27). Uses proceeds to increase backing of money base, and to bail out financial system.

Monetary Policy

Historically, from 1899 until the founding of the Central Bank in 1935, Argentina was under a currency-board regime (Table 2). The *Caja de Conversión* (Conversion Office) was the institution responsible for the administration of the domestic monetary regime. The Conversion Office held the typical macroeconomic responsibility of a currency-board: during periods of convertibility, they followed the orthodox gold-standard rules of the game, standing ready to automatically exchange domestic paper money for specie at the specified fixed nominal value of the domestic currency in terms of gold. In other words, the Conversion Office was just that, a window that mechanically and instantaneously swapped paper pesos for specie. By adopting the gold-standard system, the monetary authorities unilaterally anchored the external value of the

Table 3
Changes in Gold Stocks and the Money Base, 1900–1935

		All months			Months with DG>0			Months with DG<0			Means	
Regime	Dates	b	SE	N	b	SE	N	b	SE	N	DG	DM
Gold Std.	1900:2–1914:7	1.00	0.01	174	0.99	0.02	87	0.99	0.02	52	2.56	2.57
Float	1914:8–1919:12	1.00	0.01	65	1.00	0.01	37	-0.58	0.83	5	6.74	6.74
Float	1920:1–1927:11	1.00	0.06	95	1.00	0.04	15	1.30	0.39	8	1.90	1.90
Gold Std.	1927:12–1929:12	1.00	0.01	25	1.03	0.03	9	1.00	0.01	16	-4.43	-4.43
Float	1930:1–1931:3	1.00	0.00	15	1.00	0.00	2	1.00	0.00	12	-4.42	-4.42
Float	1931:4–1935:4	0.05	0.24	49	—	—	—	0.47	0.43	13	-6.66	0.57

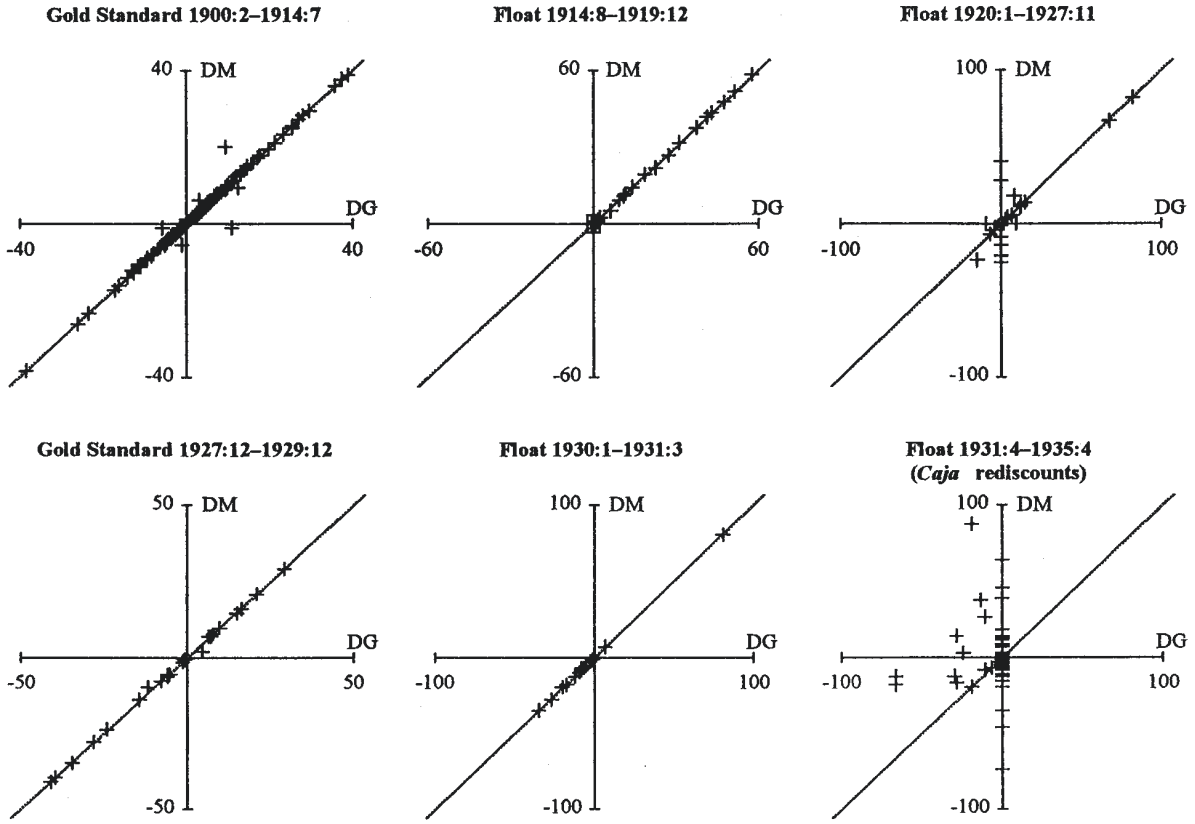
Note: Units of G (gold stock) and M (money base) are millions of paper pesos, with G evaluated at parity of 2.27 peso papel per gold peso. Regression is of DM on DG, using OLS, and reporting coefficient b, standard error SE, and
sample size N.
Source: della Paolera and Taylor (1998).

currency. Hence, they could not control the nominal quantity of money in the economy, and this quantity became an endogenous variable that depended on domestic and world money market conditions.

It is interesting to see how closely the Conversion Office adhered to these rules, and we can use high-frequency monthly data to probe the question. In a pure gold standard regime, expansions and contractions of the nominal quantity of money are exactly correlated with variations in the gold stock at the Conversion Office. For the 1900–1914 and the 1927–1929 gold standard periods, there is a one-to-one robust association between money and gold as shown by the data in Table 3 and Figure 3. The correlation coefficient is exactly one and the sample monthly means of both money and gold stock changes are 2.6 million paper pesos for the prewar period and 4.4 million paper pesos for the 1927–1929 period. Thus, there was long-lived respect for the currency rule, and inflows and outflows of gold were fully tolerated and directly converted into changes in the money base.

More remarkably, there was even strict adherence to the money-gold rule in the float from 1914 to 1927, during a period of suspension of convertibility. In this period, as many core countries witnessed inflations and hyperinflations during and after World War One, Argentina maintained a key element of orthodoxy. There was no wild recourse to money printing, even if the exchange rate had drifted away from its anchor. Indeed, such drift in the exchange rate was unavoidable as most other countries had abandoned their pegs too after 1914 and until the mid-1920s. Unilaterally, however, Argentina did what she could to stick to orthodoxy. As was analyzed elsewhere, the suspension of convertibility was foreseen in 1914 as a temporary political-economy decision to overcome the disruption of international trade and finance during World War One. This adherence to convertibility was all the more remarkable given the enormous

Figure 3
Changes in Gold Stocks and the Money Base, 1900–1935



Notes and Sources: See Table 3.

economic contraction in the years 1914–19 already noted above. All the same, changes in money tracked changes in gold for the entire period from 1900 to 1931.

After 1914 convertibility was suspended and exchange controls applied. Nonetheless, there were occasional outflows of gold for official purposes, and at the Conversion Office these were still accompanied by a strict application of the gold-for-peso rule.[10] But for the most part, in this period 1914 to 1927 the Conversion Office worked in an asymmetric fashion: the monetary base augmented automatically when gold reserves increased but gold extractions were rarely allowed. Only in five months during 1914:8 to 1919:12 were outflows registered, and only for eight months during 1920:1 to 1927:11 (see again Table 3 and Figure 3). Consequently, in periods of demand pressure in the foreign exchange market, notably in

[10] But here note that outflows were very limited: 5 out of 65 months in 1914–20, and 8 out of 95 months in 1920–27. Thus the coefficients for the outflows sample yield large standard errors. Still, the hypothesis of a unit coefficient cannot be rejected.

the recession of 1920–21, whilst adherence to the "rules of the game" would have allowed a large gold drain and a monetary contraction, in contrast the quantity of base money remained unchanged and adjustment instead took the form of a depreciation of the exchange rate, or, an increase in the paper currency premium relative to the paper-gold par (Figure 4).[11] However, it was recognized by policymakers and even by the market players that resumption at par was the only possible steady state solution to the turbulence in the monetary and financial markets. How could this tension be resolved?

A "one-way" gold standard, as this has been called, was still consistent with the long run goal of resumption at par. for a simple reason. During the boom years of 1900–14, Argentina had built up a huge gold backing for the currency; and from 1914 to the mid-1920s Argentina had husbanded that stock carefully via the "one-way" devices of the Conversion Office. By the mid-1920s, resumption still looked credible because this strategy left Argentina with much stronger backing for the currency, at least as compared to many core countries, as the gold-exchange standard was built. Thus, actions and beliefs reinforced each other during this "one-way" gold-standard regime. Actions were geared to the monetization of gold inflows to expand the quantity of money but officials at the Conversion Office were strict about targeting the gold-backing of the quantity of money to a minimum of 78% in the turbulent 1920–25 years. At the same time, core gold standard countries such as Italy, Netherlands, Norway, or the United States never surpassed a gold-cover ratio of 50% of the money base.

It is relevant to ask what price Argentina paid in terms of deviation from parity in the foreign exchange market given this curious "one-way" gold standard policy. Did the exchange rate rise well above par, requiring a big appreciation to permit resumption? Not at all. The most dramatic foreign exchange crisis in 1920–21 combined sudden declines in export volumes and the terms of trade. Even so, the premium over par in the foreign exchange market never went above 33%,[12] European countries could achieve such close convergence to prewar parity only by the mid-1920s, when they started to resume the gold standard.

Several observers have noted that the European experience with floating exchange rates after 1914 were dismal in the absence of a well-understood monetary "straight jacket" to limit expansionary monetary policies, with monetization often deriving from unsustainable fiscal gaps.[13] Conditions in Argentina could

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[11] See della Paolera (1994, 34–36).

[12] In the opposite circumstance, of gold inflow pressure, Argentina was even more orthodox than other countries; in the 1918–19 postwar years, the paper peso strengthened well above par before the Conversion Office decided to permit and monetize incipient gold inflows. In 1918 and 1919, the paper peso in terms of the gold-peso was quoted at 2.14 and 2.2, well below the 2.27 par value.

[13] See the fascinating article by Eichengreen and Temin (1997) that analyzes the rhetoric of policy debates over the resumption of the gold standard in core European and North American countries in the 1920s.

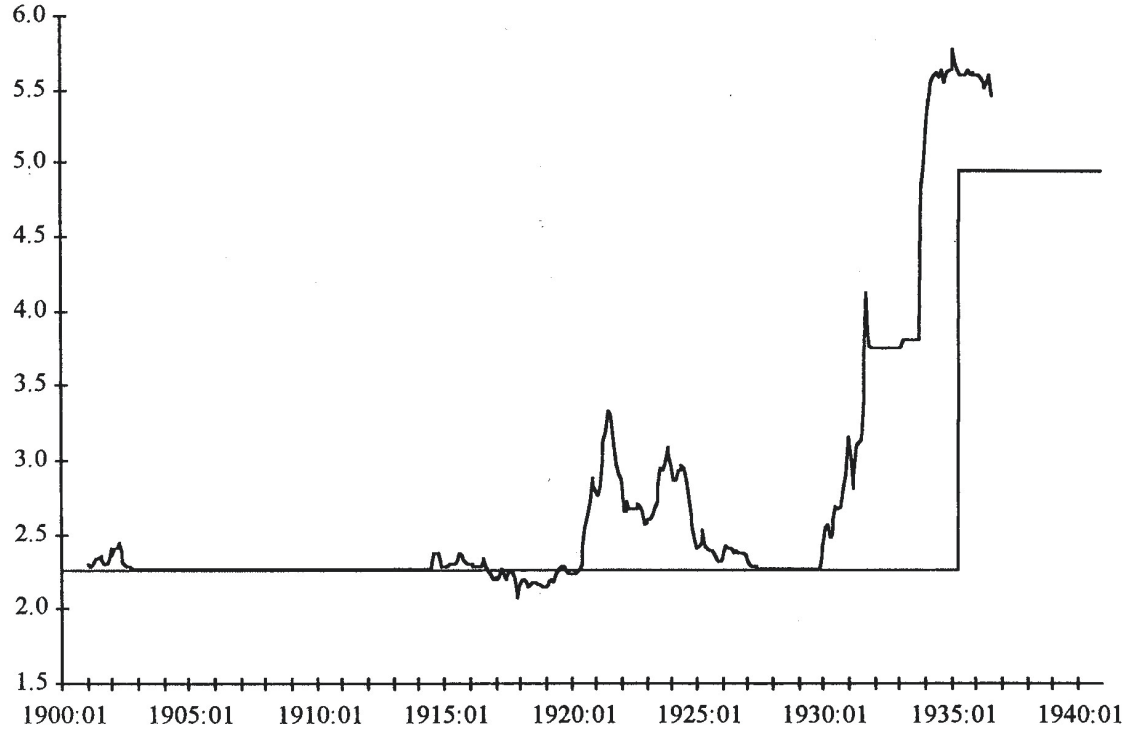
not have been more different. More orthodox than the core itself, this peripheral country, from 1914 through to resumption in 1927, lived by the rhetoric, and also the actions, of a government intent on the idea of resumption at parity. To this end, and notwithstanding the suspension of convertibility and the "one-way" gold standard, the regime in place was still essentially a metallic monetary regime, and the prevailing *mentalité* allowed no room for money issues not fully backed by gold. Historical experience with profligate monetary policies in the 1880s and before, and the inflation and economic chaos that ensued from such actions, lived on in the minds of the Argentine policymakers. Fear of repeat inflation underpinned their strong faith in the religion of the gold standard, which they saw as an effective way for the Argentine authorities to tie their own hands. Even the severe 1914–19 economic downturn could not break this commitment.

Students who focus on the impact of World War One on the Argentine economy might dispute the idea that from 1900 to 1931 the country maintained a metallic regime because of the emergency laws installed in August 1914 to overcome the severe financial crisis. The purpose of the 1914 rediscount law was twofold. First, it established that the state-owned Banco de la Nación could rediscount commercial paper from other private commercial banks by using up liquid reserves (that is by declining its vault-cash-to-deposit ratio. Second, it established that, with the consent of the Executive Power, the Conversion Office could also effect emergency issues (that is, non-backed increases in the quantity of money) as long as gold reserves at the Conversion Office never fell below 40% of the outstanding money base.

The first measure was intended to delegate to the Banco de la Nación, a quasi-public bank, and the largest of all banks, the microeconomic responsibility to forestall liquidity problems in the financial system. In that sense, one might say that the Banco de la Nación was a forerunner of the Central Bank because it had a rediscount window. However, the action of rediscounting commercial paper through this first provision in the law could only effect a change in inside money, or banking money (M3), and not in the monetary base (M0) which was controlled by the Conversion Office.

More important, therefore, is the second provision of the law that allowed the Conversion Office to rediscount commercial and government paper so long as gold backing stayed above a 40% lower bound. Here we see, as early as 1914, and just 15 years after the 1899 convertibility law, that there was a clear innovation: the design of an institutional capability that would permit the Conversion Office to de-link gold and currency movements. Was it used at all? In the period to April 1931 the answer is: almost never. With

Figure 4
Exchange Rate, Paper Pesos per Gold Peso versus Par, 1900–1940



Notes: Par is 2.27 paper pesos per gold peso until April 1935, and 4.96 from May 1935.
Source: Baiocco (1937).

the exception of three months in the economic crisis of 1925, the monetary authorities never issued fiduciary notes.[14]

Let us examine the evolution of the money base and the actions of the monetary authorities. Figure 5 shows the evolution of the money base (M0) and its components during the years of the Conversion Office (January 1900 to April 1935) and the first years of the Central Bank (May 1935 to December 1940). The constancy of the fiduciary issue of the Conversion Office is immediately apparent in the first component of the money base, and, above it we see the gold-backed component: the strict gold-money rule applied. Except for a small blip in 1925, and a few other months (where lags kept gold and money slightly

[14] The conservatism of the Conversion Office contrasts markedly with the more activist behavior of the Banco de la Nación. The bank rediscounted commercial paper in a countercyclical fashion (Salama, 1997). However at its maximum, rediscounts never represented more than 4% of a broad definition of money such as M3.

out of synchronization), there were no new money issue not covered by gold at the Conversion Office.[15] For this reason we found the very strict correlations between gold and money seen in Table 3 and Figure 3. Consequently, we think of there being no significant change of monetary regime until 1931.

The old regime survived from 1900, through the years of turmoil from 1914 until resumption in 1929, and even beyond the last departure from convertibility in 1929 until 1931. But the previously noted deflationary pressures and fiscal strains unleashed by the World Depression were sufficient to expose the suffocating potential of the gold standard "straight jacket." Moreover, given the circumstances, mere suspension of the gold standard did not suffice to provide release from gold standard *mentalité*. If gold had to be spent in a fiscal rearguard action, the traditional operations of the Conversion Office would have led to major adverse monetary shock, unless the rules of the game changed. They did:

> Maintenance of liquidity was not simply a matter of ending convertibility. On the one hand, even after the abandonment of the gold standard, some countries such as Argentina shipped gold abroad to service the external debt and sold foreign exchange to stem the currency depreciation. On the other hand, as early as 1931 South American monetary authorities began to adopt measures which Professor E. W. Kemmerer and Sir Otto Niemeyer would have found unsound. Thus, the Argentine Caja de Conversión, whose old and only duty was to exchange gold for domestic currency and vice versa, began in 1931 to issue domestic currency in exchange for private commercial paper. By 1931 the old Caja even issued domestic currency against treasury paper (Díaz Alejandro, 1983, 16–17)

It is therefore very important to note that the association between money and gold totally breaks down for the period after April 1931 (Table 3 and Figure 3). Gold inflows ceased at this point, but subsequent gold outflows for fiscal use were sterilized. In many months there we no gold movements, but the Conversion Office unilaterally changed the nominal stock of money. Accordingly, we consider this *the* decisive regime change for Argentine economic policy, certainly during the Great Depression and possibly for the twentieth century as a whole. It was then that rediscounts began at the Conversion Office (Figure 5). These rediscounts offset the gold losses that began in 1929, and the fiscal use of gold in the subsequent years. The rediscounts began under the auspices of the 1914 law, and were soon augmented by a new series of rediscounts of treasury paper under the "Patriotic Loan" legislation of 1932, which further enhanced the power of the Conversion Office to make new fiduciary issues via open market operations.

Thus it was in April 1931 that the macroeconomic and, specifically, the monetary regime shifted from being a metallic regime to a fiduciary regime. At the end of that year, after just nine months, fiat notes rediscounted by the Conversion Office went from zero to represent a 30% of the outstanding monetary

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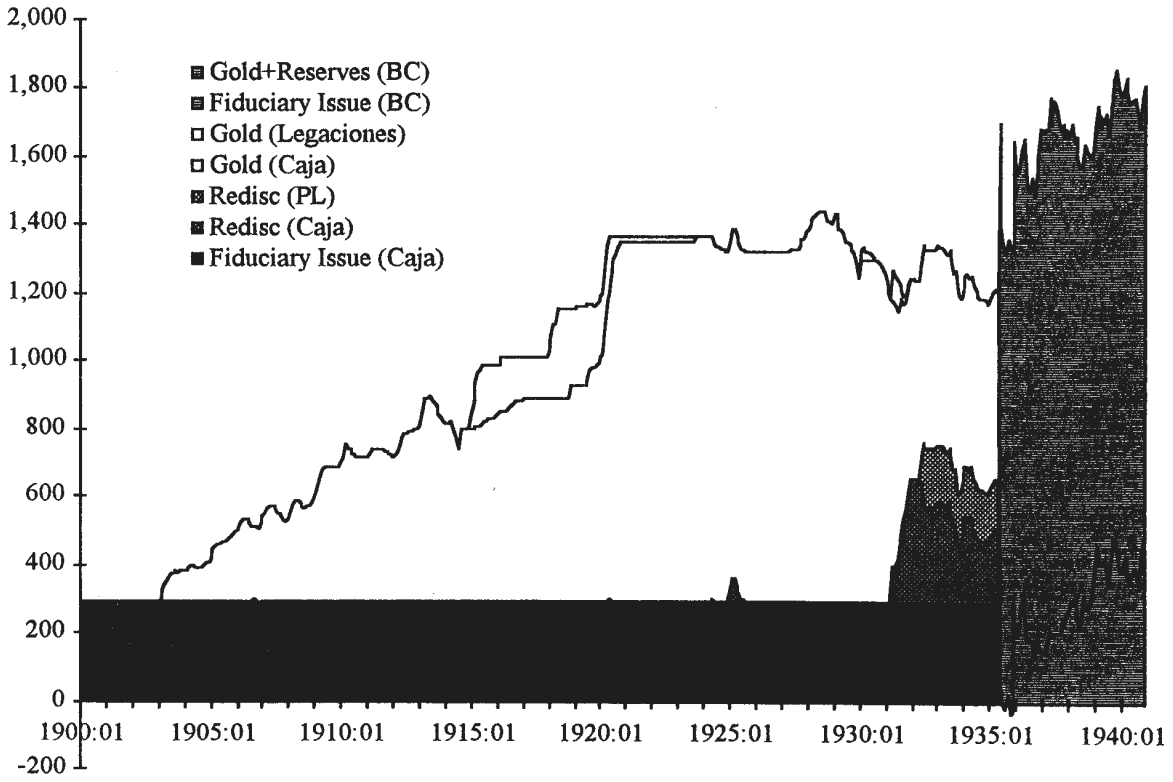
[15] Note that during World War One, and to a lesser extent in the early 1930s, difficulties in shipping gold out of Europe meant that incipient gold inflows to Argentina were held in European vaults (*Legaciónes)*, but were the property of the Conversion Office. These were counted as gold backing, and are denoted separately in Figure 5.

Figure 5
Composition of the Money Base, 1900–1940



Note: Units are millions of paper pesos.
Source: della Paolera and Taylor (1998).

base. In 1932, the stock of fiat issues rediscounted by the virtue of the Law of 1914 accounted for 35% of the monetary base. At that time, the gold backing had already fallen from the targeted 78% in 1929 to 43%, a ratio slightly above the lower bound limit allowed by the law. In this context, it is instructive to examine expectations as indicated by behavior in foreign exchange markets: in 1930, the gold premium stood at a maximum of 28% still below the 1923 mark. However, when the authorities sterilized the fiscal outflow of gold in 1931 and began rediscounting, the premium skyrocketed to 81% and never reverted to a lower value (see Figure 4).

The reaction of the foreign exchange market was a (very rapid) manifestation of beliefs that had changed: agents increasingly were coming to see the delinking of gold and currency as an increasingly permanent phenomenon. In a moment, when we will examine the mechanics of institutional change and the impact of monetary policy, we will see that the macroeconomic regime saw a drastic quantifiable change in 1931. We argue that this precocious heterodox approach by policymakers might have helped Argentina

avoid a severe economic collapse in the Great Depression of the kind seen in so many other countries. The decisive delinking of gold flows and the change in the quantity of money are evident from the figures presented in the fourth quadrant in Figure 3. For the 1931–1935 period the average annual change in the gold stock was –6.7 million paper pesos but the average annual million pesos change in the quantity of money was +0.6 million paper pesos.

However, before pursuing a quantitative analysis we think it important to note exactly how remarkable it was that policymakers were able to make such a dramatic change in regime given the decades of adherence to monetary orthodoxy. From a political economy point of view, how was it possible for such heterodox policies be contemplated in a country that had witnessed the Baring crash and had struggled for years to maintain credible monetary and financial institutions?

The Political Economy of Reflation in Argentina: A *Deja-Vu* in 1929?

The very costly effects of deflation on the economy were nothing new in Argentine macroeconomic history. Was this just a seemingly unfortunate fact? The only benefit was what could be learned from the experience.

In the aftermath of the 1891 Baring crash, the paper peso, previously equivalent to one gold peso (and one gold dollar) by the virtue of the 1881 Convertibility Law, suffered a depreciation of 274%. In spite of the severe misalignment, in 1893, and in the middle of negotiations with international creditors to settle the external debt situation, Argentine monetary authorities assured international investors that convertibility would be resumed at anytime and at par. Subsequently, however, there arose a political-economy debate on whether a gold standard regime should be restored at the original 1881 parity, or if, instead, a conversion was to be pursued at the then prevailing market exchange rate, thus accommodating the devaluation.[16] Urban sectors and commercial interests favored a convertibility plan fixed at par, while exporters and industrial sectors called for a higher nominal exchange rate because they believed that any further deflation of the economy would undermine the profitability of the real sector.

The most important political-economy argument denouncing the damaging effects of deflation originated with Silvio Gesell (1862–1930). In an article entitled "Monetary Anemia" written in 1898, Gesell noted the problem of the debt-deflation trap, anticipating Irving Fisher's original work by almost thirty years: "If money gets more expensive, debts increase in exact proportion to the rise in the cost of money. Nominally nothing changes, but materially the debt load increases. With the prospect of having to

[16] This section follows closely della Paolera (1994, 28–29).

pay triple what one received, who will dare go into debt to start a new industry in the country?....The increase in the value of money is the common cause for all the country's economic troubles...."[17] Gesell's fear of deflation came to be the dominant view, and the idea of a resumption at par was abandoned. Finally in 1899 Argentina regained the Gold Standard at a new par rate of 2.2727 paper pesos per gold peso, using the revaluation of gold as a mean to restore a fixed exchange rate regime.

The influence of Gesell's ideas on the importance of changing negative expectations to escape a deflationary trap was recognized a long time ago by Irving Fisher and John Maynard Keynes. In his book *Stamp Scrip* (1933), Fisher acknowledges Gesell's innovative ideas on a fiduciary regime as follows: "Medicine owes much to untrained minds, or at least to minds untrained in medicine. Even Pasteur, though a trained scientist, was not a doctor; and the laryngoscope was perfected, some say actually invented, by a great singing master, one Manuel Garcia, of Spain. Silvio Gesell, who died recently, was a German businessman and quasi-economist. He lived in Argentina and wrote some of his many papers in the Spanish language. In 1890, while in Argentina, he proposed essentially that particular substitute for money which now bids fair to sweep this country [the United States] under the name of Stamp Scrip. Gesell before he died, accumulated a considerable following abroad; but it took the tortures of a depression to bring about any practical efforts to make use of his Stamp Scrip idea. There is much in Gesell's philosophy to which, as an economist, I cannot subscribe, especially his theory of interest; but Stamp Scrip, I believe, can, in the present emergency, be made at least as useful an invention as Manuel Garcia's laryngoscope."[18]

John Maynard Keynes went even further in recognizing Gesell's influence in the *General Theory* (193x): "The great puzzle of Effective Demand with which Malthus had wrestled vanished from economic literature. You will not find it mentioned even once in the whole works of Marshall, Edgeworth and Professor Pigou, from whose hands the classical theory has received its most mature imbodiment. It could only live on furtively, below the surface, in the underworlds of Karl Marx, Silvio Gesell or Major Douglas..."; then, in his Chapter Notes on Mercantilism, the Usury Laws, Stamped Money and Theories of Under-consumption, Keynes remarked that "[i]t is convenient to mention at this point the strange, unduly neglected prophet Silvio Gesell whose work contains flashes of deep insight...."; after this Keynes spent about a dozen pages explaining Gesell's specific contribution to the theory of money and interest.[19]

Gesell was certainly influential in the 1899 decision to resume convertibility at a higher nominal exchange, and he gained much attention for his critique of a fixed nominal quantity of money as a sub-

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[17] See Silvio Gesell (1909), and especially the articles "La pletora monetaria" (written in 1909) and "La anemia monetaria" (written in 1898). Note the discussion on pages 20–23.

[18] Fisher (1933, 17–18).

[19] Keynes (1931, 32, 353–358, 371–379).

optimal monetary rule. Yet, interestingly enough, he is barely mentioned by the other main influential intellectual figure in our story, Raúl Prebisch.

Prebisch was not only the key policymaker and architect responsible for the creation of the Central Bank in 1935, but, most importantly, he was also a most influential and respected economist of the day, perhaps the only one who could challenge the prevailing *mentalité*, and conceive of a policy change to avoid the severe consequences of deflation in line with Gesell's ideas. Already in 1921, he had written a brilliant article on the problems of the Argentine currency showing that he understood the costly effects of deflation.[20] During the *de facto* government of General Uriburu (1930–31), Raúl Prebisch was the Undersecretary of Finance; but more significantly he was the creative figure of policymaking.

A critical task for Prebisch was to persuade other policymakers to come around to his position. Among the various protagonists, one crucial person was Federico Pinedo, a politician and economist who at first viewed deviation from monetary orthodoxy with suspicion. In an interview years later, we find an illuminating dialogue between Prebisch and Mateo Magariños where Prebisch explains how the change in monetary regime came about:

> *Prebisch*: "I am going to give you an idea of how Federico Pinedo was converted to the idea of creating a Central Bank. As I have said, when the General Uriburu spoke about the convenience of studying the creation of a central bank, in the report I wrote, Pinedo, in a series of conferences, disputed the idea. And he did it in a harsh manner. At the time, I knew him very little. But during the world depression there was a situation, when I was the Undersecretary of the Treasury, a catastrophic situation. The banking system was on the verge of collapse and we decided—I had the idea—to invoke an old rediscounting law that was never applied. The law was approved during World War One, in the first week of panic that we experienced, and it allowed the Conversion Office to rediscount banking paper. We made it operational....we stated that the rediscount law was to be applied....Then Pinedo, who was in the opposition to the Provisional Government, in spite of having been a revolutionary, enrolled with the Partido Socialista Independiente....He came to see me, I have now a clear picture of that moment; he said: "Prebisch, what mistake are you going to make?" («*¿Que barbaridad van a hacer?*») He was agitated...so nervous that he did not want to sit down...I explained to him the critical situation of the Banco de la Nación. The Banco de la Nación was the institution which administered the Clearing House. The money that the Banco de la Nación had in the vaults was below the cash at the Clearing House. That tells you about the gravity of the situation.
>
> *Q*: In which period did this occur?
>
> *Prebisch*: This was in the year 1932—no, in the year '31, in the depth of the world depression. I gave him a huge amount of confidential information....
>
> *Q*: And the issue was starting the project to create the Central Bank?
>
> *Prebisch*: No, no, no. It was putting in motion a rediscounting law to allow the Conversion Office to rediscount. And Pinedo believed that we would provoke inflation. I explained to him for two hours. I did not hide any secret....He asked me a few questions and he started to become more calm. After two hours standing up I said: "Ok, Doctor Pinedo, you now know how is the situation.

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[20] Prebisch (1922).

> What would you do if you were in my shoes in the cabinet of the Ministry of Finance?" And he had the loyalty of saying, and this is why I admired him so much: "the same thing that you are proposing". He said nothing more. His criticism of the government ceased. For the first time he understood in the dramatic crisis that engulfed the country and the financial system. And he started to support the measures of the government...He convinced himself that there was no backtrack, that the Argentine monetary system based on the automatic exchange of gold for paper and paper for gold could not function. But this was in the year 1931. Then 1932 and 1933 elapsed and, when he was minister of Finance in 1934 he called me, and he asked me to draft the proposal for the creation of the Central Bank....[21]

In short, led by Prebisch, a consensus was reached by the economic intelligentsia in Argentina in which they clearly understood that the time had come to abandon the rigid constraints imposed by a metallic monetary regime. As elsewhere, the intellectual battle to break the old regime was not easy because of entrenched fears of lax monetary policy in the minds of people like Pinedo: "The then heterodox South American monetary policies, which started around 1932, were in some ways a 'relapse' into past inflationary propensities, a past which was meant to be exorcised by the adoption of gold standard rules...indeed, memories of wild inflation under inconvertible paper during the late nineteenth century, memories still fresh during 1929–1931, hampered and slowed down the adoption of more self-assured and expansionist monetary policies" (Díaz Alejandro 1983, 18). But the late nineteenth century also offered other lessons, and the change of regime built on the ideas of Gesell and others, and on public perceptions informed by another deflationary spiral, that suffered in the 1890s crisis. No one was to perceive this as a temporary political economy decision, but as a fundamental break from the past: but could it save the Argentine economy?

Institutional Change: The Impact of Monetary Policy

In the discussion so far we have found strong *prima facie* evidence that if any policy actions mattered for Argentina's economic recovery from the Great Depression, it was most likely monetary policies and the change of regime that were central. In this section we attempt to quantify the impact of these policies on the evolution of the macroeconomy in the 1930s using standard econometric techniques.

We first attempt to assess the link between monetary variables and nominally-denominated prices, by examining the evolution of prices and exchange rates using a vector-error correction model subject to a long-run PPP constraint. We show that monetary policy, when finally used, did have the potential to effect transitory real devaluations to stimulate the home economy, a channel for recovery noted in Eichengreen and Sachs (1985) and Campa (1990). However, the impact of such policies was small in the Argentine

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[21] Own translation from Mateo Magariños, *Dialogos con Raúl Prebisch* (1991), pages 108-109 and 110.

case: counterfactuals show that even with an orthodox monetary policy the path of exchange rates and prices would have been little different. This follows from the fact that Argentine sterilization operations, although they offset some of the gold outflows, did not aggressively inflate the economy.

We next attempt to examine another channel, via the credit markets, focusing on the real interest rate effects of a change in monetary regime. This channel was studied by Romer (1992) for the United States, and we employ a similar technique here, using the Mishkin (1992) method for forecasting interest rates. Our results show a big change in 1931 in the path of real interest rates, and counterfactuals show that absent any such change, the persistence of deflationary expectations would have assured much higher real interest rates for several years, thus diminishing the chances of recovery. Thus the "Mundell effect"—to use Temin's (1989) terminology—was critical in the Argentine recovery: discarding the gold standard convinced private agents that the risk of deflation was eliminated, and expectations changed accordingly. A concluding analysis of the real side of the economy, focusing on consumption and investment (following Romer 1992), shows these channels at work.

The Model

Our model of the impact of monetary policy is a three-equation dynamic econometric model of exchange rates, prices, and interest rates. The system is estimated using OLS on annual data for the period 1884 to 1941, and is used for counterfactual analysis under alternative monetary policies in the 1930s. The equations are:

$$\Delta \ln E_t = a_1 + b_1(L)\,(\Delta \ln E_{t-1},\ \Delta \ln P_{t-1}) + c_1(L)\,(\Delta \ln M_t,\ \Delta \ln P^*_t) + d_1(L) \ln q_{t-1} + e_{1t} \qquad (1)$$

$$\Delta \ln P_t = a_2 + b_2(L)\,(\Delta \ln E_{t-1},\ \Delta \ln P_{t-1}) + c_2(L)\,(\Delta \ln M_t,\ \Delta \ln P^*_t) + d_2(L) \ln q_{t-1} + e_{2t} \qquad (2)$$

$$r_t = a_3 + b_3(L)\,(\Delta \ln M_t,\ \Delta \ln Y_t, \Delta \ln P_{t-1}, i_{t-1}) + e_{3t} \qquad (3)$$

where

E = exchange rate in paper pesos per U.S. dollar;

P = price level;

M = money base (M0);

P* = U.S. price level;

$q = \ln (EP^*/P)$ = log real exchange rate;

i = nominal interest rate;

r = real interest rate = $i - \Delta \ln P$;

Y = real output.

Equations (1) and (2) model adjustments of the real exchange rate as being driven by two forces: endogenous adjustment via the lags of E and P and the error correction term q; and exogenous adjustments via forcing terms M and P*.[22] Note that we impose a cointegrating vector that assumes PPP, so that q is the relevant error correction term. We also allow monetary policy effects, to the extent that they are orthogonal to q, and any serial correlation terms, to have an impact. This might be viewed as "independent" components of monetary policy; for example, money innovations not, say, predicted via the price-specie-flow rule (that is, via q). Since our sample is 1884 to 1941, the bulk of these years (excluding 1900–14 and 1927–29) are years of inconvertibility, and the assumption of complete exogeneity of money is more reasonable. In principle, we could allow for lags in the polynomial lag coefficients of the vector $b_i(L)$ and the scalar $c_i(L)$ and $d_i(L)$, for i=1,2, but a step-down procedure over five lags found that only the first lags were significant.[23] Equation (3) is a standard Mishkin (1992) interest rate forecasting equation of the type used by Romer (19xx) in her analysis of the U.S. Great Depression. It is used here in a similar form, with three lags found significant in the polynomial $b_2(L)$ using a step down procedure. Table 4 shows the estimated model.

The estimated model looks reasonable. In equations (1) and (2), exchange rates and prices adjust in accord with PPP as they react to the lagged real exchange rate. There is fast pass through in one period from money to exchange rates (a coefficient of 0.25), but slower pass through to prices (a coefficient of 0.16), a common structure in open economy macromodels, reflecting fast adjustment in financial markets but more nominal rigidities in the economy as a whole. Foreign prices pass through to domestic prices quickly, as one would expect in a small open economy. With noninstantaneous adjustment, there is scope for monetary policy to effect real devaluations. In equation (3) the real interest rate prediction is most significantly affected by lagged money growth, and there is scope here for money expansions to drive down real interest rates. Thus, we are now in a position to evaluate the path of the left-hand side variables under alternative monetary regimes.

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[22] Here we follow the methodology of Horvath and Watson (1995), but we treat the U.S. price level as exogenous to the Argentine economy, a not unreasonable assumption.

[23] In addition, to model dynamics, we add a fourth updating identity:

(4) $\Delta \log q_t = \Delta \log E_t + \Delta \log P^*_{t-1} - \Delta \log P^*_t$.

The Counterfactual

Did monetary policies under a new regime end the Argentine Great Depression? As far as having faith in the gold standard, did Argentina need to lose that religion to start a recovery? And was it the conversion of the *Caja* to a new religion that mattered most? It is important now to specify what the appropriate counterfactual might be. The above questions contain an implicit counterfactual that needs to be examined: essentially, had the monetary regime not changed, what would have happened? We can think of two cases that could be considered.

The basic counterfactual (CF1) examines what would have happened absent the expansion of domestic credit begun by the Conversion Office in mid-1931. In the counterfactual, we assume that in all other respects the monetary authority would have continued to act as it had from the end of convertibility in 1929: it would have worked passively in converting paper into gold at the parity rate. The sole movements of gold would have continued to be the fiscal use of gold by the central government to service external debt, so we do not admit any private gold flows. However, the sole change in the counterfactual is to no longer allow the currency board to break the rules, and attempt to sterilize the gold outflows by rediscounting.

Table 4
A Model of Prices, Exchange Rates, and Interest Rates

(a) VAR Model of Exchange Rates and Prices

Dependent Variable	Δ ln E	Δ ln P
Constant	0.11 (0.2)	-0.73 (1.6)
Δ ln E{1}	0.02 (0.1)	0.30 (1.7)
Δ ln P{1}	0.04 (0.2)	-0.09 (0.6)
Δ ln M	0.25 (1.6)	0.16 (1.1)
Δ ln PUS	-0.51 (1.6)	1.21 (4.2)
Q{1}	-0.02 (0.2)	0.16 (1.6)
Observations	56	56
R squared	.15	.35
Mean of Dependent Variable	0.02	0.02
Std Error of Dependent Variable	0.11	0.12
Standard Error of Estimate	0.11	0.10
Regression F(5,50)	1.45	4.69

(b) Mishkin-type Forecast of Real Interest Rate

Dependent Variable	r
Constant	9.69 (1.1)
Δ ln M	-47.24 (3.0)
Δ ln M{1}	-44.10 (2.6)
Δ ln M{2}	-48.26 (2.8)
Δ ln Y	71.73 (2.6)
Δ ln Y{1}	-4.64 (0.2)
Δ ln Y{2}	17.02 (0.6)
i{1}	-0.27 (0.1)
i{2}	3.23 (0.9)
i{3}	-3.50 (1.4)
Δ ln P{1}	9.91 (0.7)
Δ ln P{2}	25.64 (1.8)
Δ ln P{3}	23.11 (1.8)
Observations	54
R squared	.52
Mean of Dependent Variable	3.46
Std Error of Dependent Variable	12.76
Standard Error of Estimate	10.42
Regression F(5,50)	3.20

Notes: For an explanation of the equations see text. Sample is annual data 1884–1941. Absolute t-statistics in parentheses. X{n} denotes the nth lag of X.
Source: della Paolera and Taylor (1998).

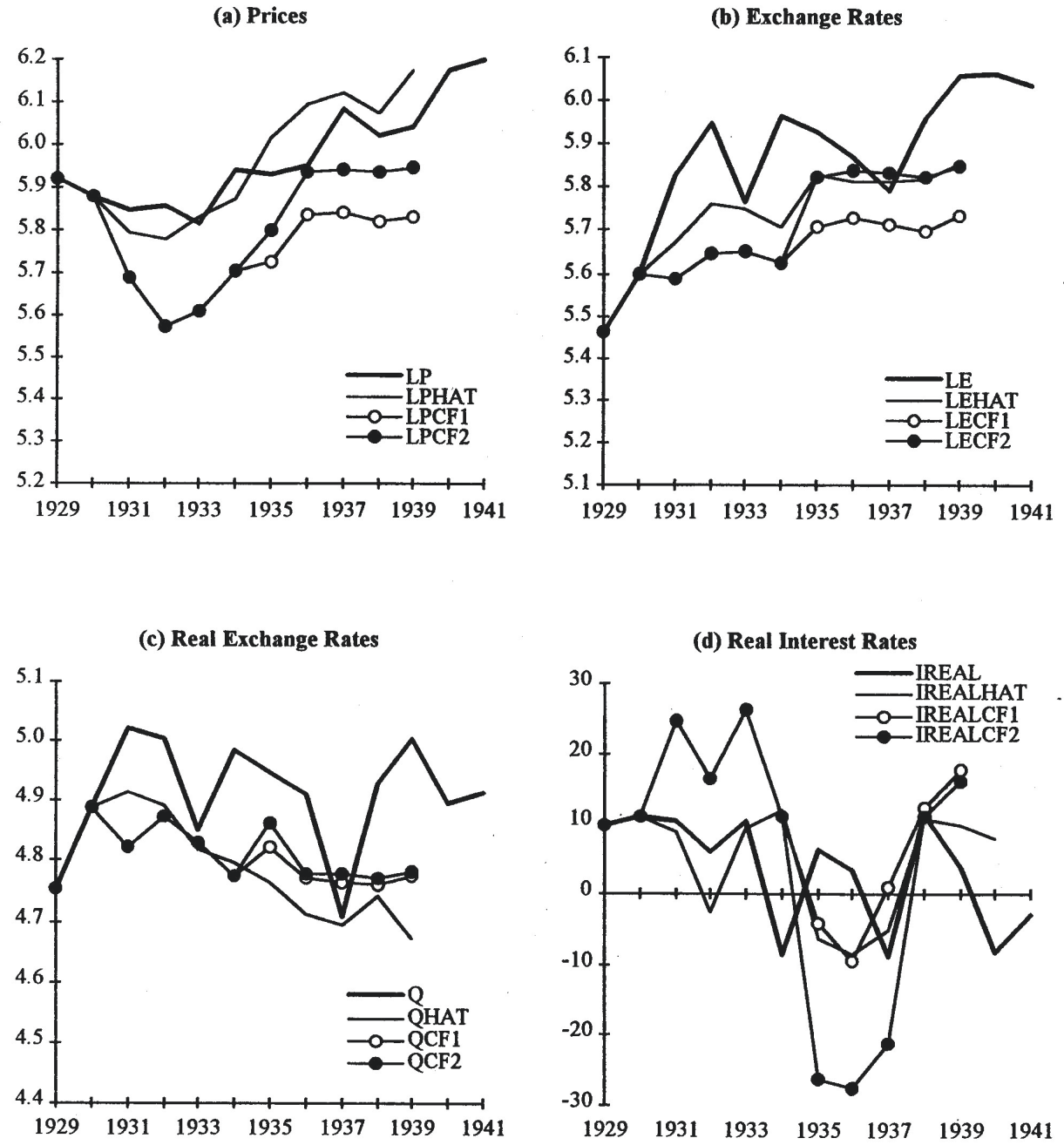
In a second and less harsh counterfactual (CF2) we impose the same path for money, except that we permit the authorities to revalue gold, as actually happened, in 1935. But we still permit no other forms of monetary expansion after 1935, and leave changes in money base as being solely based on the the actual path of gold and reserve stocks of the Central Bank. Thus, in CF1, we effectively imagine a world without a Central Bank. In CF2, we effectively imagine a world without the Conversion Office rediscounts, but still allowing the Central Bank to revalue gold.

Both counterfactuals imply large shocks to the path of money relative to its actual path, as a glance back at Table 1 confirms. From 1929 to 1934, M0 held constant at around 1,200 million pesos, but this included substantial injections of domestic credit after 1931 by the Conversion Office to offset gold losses. Gold stocks fell by almost half, from 954 million pesos (evaluated at parity) in 1929, to 561 million in 1934, but after 1931 domestic credit was expanded from 293 million pesos (its level since 1900, and inherited from the pre-1900 fiduciary regime), and reached 610 million in 1934, almost exactly offsetting the gold loss. Thus, in CF1 and CF2, the money supply would have been contracted by about 327 million pesos in 1934, from 1,172 million pesos to 845 million. Both counterfactuals would have implied a counterfactual decline in 1934 of about 28% in money base—a massive nominal shock.

After 1935, the impacts would have been small, however, in CF2, since the revaluation in 1935 added almost a billion pesos to the gold backing, expanding it from 561 million paper pesos, to 1,354 million, as a result of the peso's loss of more than half its value relative to the old parity of 2.27. Arithmetically, this overnight "expansion" of gold automatically implied a reduction in the accounting figure for domestic credit, even after the 1934–35 expansion of the money base by almost 500 million pesos: the excess "new" gold cover allowed the Central Bank to create an apparent reduction in domestic credit from 610 million pesos in December 1934 to just 293 million in December 1935 (See Table 1 and Figure 4).[24] Under CF1, conditions after 1935 would have been tougher: absent revaluation, the path of reserves after 1935 would have been flat, still in 1940 at roughly the same level as 1935: there would never have been a significant expansion of the gold stock and the money base to compensate for the almost one third decline in money base after 1929.

[24] In fact, money injection was not instantaneous, as can be seen from the monthly data, so, for the first couple of months of the Central Bank's existence domestic credit was actually *negative*—that is, gold and reserve backing at the new parity exceeded the outstanding money base: backing was more than 100%. See Figure 4.

Figure 6
Actual, Fitted, and Counterfactual Series for Prices, Exchange Rates, and Interest Rates, 1929–41



Notes: See text and Table 4. LE = ln E; LP = ln P; Q = ln(EP*/P), IREAL = r; XHAT = fitted value of X; XCF1 = value of X in first counterfactual; XCF2 = value of X in second counterfactual.
Source: della Paolera and Taylor (1998).

Figure 6 shows the paths for prices, exchange rates, and interest rates in the two counterfactuals, using the above estimated model. The results show movements in the various variables that accord with intuition as regards the direction of change. However, it is the qualitative importance of the magnitude of these changes that is of the essence here.[25]

Prices

The actual log price level (LP) showed continued declines in 1929–33, for a cumulative decline of a about 5%–10% in those years. The level then rose markedly throughout the rest of the 1930s, except for a sharp deflation in the recession of 1938. The 1929 level was regained in 1935, and a further 20%–30% increase was seen by 1940. The fitted series for prices from the model tracks the actual level very closely over the entire period. In the counterfactuals it is clear that Argentina would have suffered a more severe and extended deflation in the early 1930s. In both counterfactuals, with no rediscounting in 1931–34, the price level would have fallen about 40% rather than a mere 5%–10%, a scenario which would have amplified and prolonged deflationary expectations. In the CF2, prices barely regain their 1929 price level after 1935 even with the huge gold revaluation. This is not surprising, for although gold revaluation injected about 800 million pesos in 1935, almost double the gold outflow of 400 million in 1929–34 (see Table 1), the model also incorporates a pass-through of foreign prices into domestic via PPP, and significant imported US deflation could only just be offset by the revalution. Worse still would have been the outcome without a revaluation: CF1 shows a persistent 10% decline in prices below the 1929 level, raising the question as to whether deflationary expectations would have ever been erased in the 1930s under the old regime.

Exchange Rates

Actual exchange rates depreciated markedly after the end of convertibility in 1929, with a more than 50% loss of value for the peso by 1935. This development seriously undermined the credibility of a resumption at the prevailing par of 2.27, with two beneficial side effects. First, agents began to doubt the idea of deflation as a future possibility, as it would have to had to be very severe to reestablish par. Second, the large move in the exchange rate encouraged Prebisch to plan a revaluation of the Central Bank's gold stock, thus cementing expectations even more firmly after 1935. When par was unilateral adjusted from 2.27 to 4.96 in May 1935, there was no turning back (Figure 4). The fit of the exchange rate regression is poorer (see LEHAT in Figure 6), but the counterfactuals show the expected effects (se LECF1 and

[25] Note that all fitted values are derived using one-step-ahead forecast—i.e., actual lagged values are used. For the counterfactuals, dynamic forecast are used, where current fitted values are saved and used as future lagged values.

LECF2). Absent the rediscounting, the exchange rate would have been 15%–20% stronger in 1931–34. This should not be dismissed as trivial: the reversibility, via deflation, of a 15% depreciation is a lot more plausible than the reversal of a 50% depreciation. Indeed, such movements in the paper-gold exchange rate had been reversed in the 1920s to permit resumption in 1927 (see Figure 4). It is thus not clear whether, in the counterfactual world, agents would have been sure of a permanent regime shift. Without the revaluation of 1935, the scenario looks even worse: the mild depreciation persists into the late 1930s, and, with it, the probability of possibility of a deflation to regain the old par, as in the 1920s. In contrast, the actual story for the exchange rate makes clear the regime shift: once the paper-gold exchange rate had risen into the range of 5 to 6, agents could be pretty sure that the government would not be embarking on a deflationary attack to reactivate the old regime: the costs, political and economic, would have been too high, and the action thus highly implausible. Instead, drawing on their own history, Argentines would see a parallel to the resumption in 1900 after the inflation of the 1890s, when a sufficiently large devaluation of the paper peso relative to gold (from 1.0 to 2.27) required a shift to a new parity to escape the deflation trap.[26]

Real Exchange Rates

For further comparison we take the above data on prices and exchange rates, and the U.S. price series, and derive the path of log real exchange rates (Q). The real depreciation of 1929–31 is apparent, but the reversion to PPP is also clear in the figure. Further, the impact of monetary policy as seen in the counterfactual experiments appears weak. Certainly, absent the rediscounts, there would have been less real depreciation after 1931, but only by 5%–10%. Similarly, after 1935, the real exchange rate would have deviated little from its fitted value. We conclude that the real exchange rate channel was only a weak conduit for the impact of Argentine monetary policy. This, in part, reflects the counterbalancing impacts of foreign monetary policy in 1929–31. The much criticized tight policies of the U.S. Federal Reserve could, according to this view, be seen as the dominant cause of depreciation of the peso relative to the dollar, as compared to the relatively mild effects of Argentina's moderate sterilization policy. Similarly, the real exchange rate effects of Argentina's policy might be expected to be small, as compared to the much bigger effect of U.S. monetary policy on U.S. prices and exchange rates. In this view of the world, mistakes by the U.S. monetary authority helped other countries recover because of their beggar-thyself (or enrich-thy-neighbor) impact on real activity via the real exchange rate channel. So, does this imply that recovery was

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[26] Or in the international context of the 1920s and 1930s, agents could look overseas for comparisons in the event that orthodox thinking should return: at 300–400 pesos a strategy akin to British deflation in the mid-1920s was conceivable, if a reversal of course was to be contemplated. At over 500 to the dollar, agents would see the situation as closer to the French scenario of the mid-1920s, with resumption at a new par or no resumption at all.

largely external in origin? And did Argentine policymakers have no real impact through their supposedly radical change of regime? We think not. But if the real exchange rate effects of Argentine monetary policy were weak, then we are forced to consider an alternative channel.

Interest Rates

Real interest rates (IREAL) were high in 1929–1931, at about 10%. Although nominal rates were much lower (Table 1), *ex post* deflation and *ex ante* expected deflation contributed to high real rates. IREALHAT, an estimate of *ex* ante real interest rates constructed using the Mishkin regression technique, adds to this sense of a deflationary regime before 1931. Thereafter, real interest rates were lower and frequently negative. The turning point was the start of rediscounts, as indicated by IREALCF1: absent this action by the Conversion Office the real interest rate would have risen dramatically to 20%–30% in the years 1931–34, largely as a result of worsening deflation (Figure 6(a)) and persistence in the forecasting equation. Such painfully high real interest rates would have had, we think, devastating effects on real activity, particularly investment, thus killing any chance of recovery. Of course, under CF2, a large injection of money would still have ensued in 1935, from the gold revaluation plan, and, proportionately this would have been much larger, as a fraction of the level of M0 in 1935, than in the actual case, absent the rediscounts of 1931–34. Thus, in CF2, there is one very big change in money base in 1935, enough to temporarily drive real interest rates very low for a year or two. Absent the revaluation, in CF1, this effect disappears and real interest rates stay higher, although they do diminish finally in 1935–36 as a result of temporary gold inflows (see Table 1).

Conclusions

The "Mundell Effect" and the Real Consequences of a Change in Regime

The work of economic historians such as Peter Temin, Barry Eichengreen, and Christina Romer has led to a new consensus as to the role of the gold standard in fostering deflation and depression in the 1920s and 1930s, and the critical impact of monetary policies as a tool for recovery.[27] Yet evidence is largely restricted, at a detailed level, to the study of the United States, Britain, France, Germany, and other countries in the core. Further research is now needed from scholars working on the economic history of less-developed countries, as we investigate to what extent the same approach to theory and evidence can be

applied to the countries of the periphery that also experienced the World Depression. This will help us understand the broad applicability of the model, and inform our view of economic history at the periphery, and our study is one step in this direction.[28]

We have presented a detailed macroeconomic picture of a peripheral economy in the Depression years. The Argentine experience exhibits both similarities and contrasts with the events in the core economies. We argue that Argentine macroeconomic policies in the 1930s did successfully avert a major disaster by subverting, if only marginally, the prevailing orthodox *mentalité* inherited from earlier epochs. Like the core economies, Argentina found itself with little room for maneuver in fiscal matters, a constraint that was made even tighter by the need to service a large external debt in the face of negotiations with the British over favorable trading terms. Fiscal orthodoxy was offset, however, by a bold change of monetary regime, from metallic to fiduciary, in an effort to dislodge deflationary expectations. This plan was the brainchild of Raúl Prebisch, and, coming far in advance of similar thinking in the core economies, was a testament to his creativity and brilliance as an economist and policymaker, and his persuasive powers in convincing powerful interests, and influential figures like Pinedo, to agree to the change he had in mind.

Given the evidence from our model, we think the main impact of monetary policy change on recovery was in the years 1931–34, when the collapse of output was reversed and recovery to the 1929 level of activity was secured. The channel was not via real depreciations due to nominal rigidities; movements in Argentine monetary policy were very small relative to changes in foreign (U.S.) monetary policy in this period. Nor was the channel the credit market, and lower nominal interest rates, the so-called "Keynes" effect; after all, nominal rates were low and had little to fall before hitting their floor. Rather, the channel was the elimination of deflationary expectations, or the so-called "Mundell" effect; after 1931, the fear of deflation was gone, expectations changed as the monetary regime shifted, and the institutional change began to look credible and permanent.

Investigating the impact of monetary policies after 1933 in the United States, Romer (1992) found a marked correlation between declines in real interest rates, and recovery in investment and consumption activity. She saw this as confirmation of the transmission mechanism from monetary policy to recovery via real interest rates. In the same fashion, we display in Figure 7 the same variables for the Argentine case. Exactly the same pattern is apparent: after 1931 *ex ante* real interest rates fell, and, as discussed, all of this

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[27] See, *inter alia*, Temin (1989), Eichengreen (1992a; 1992b); Eichengreen and Temin (1997); Eichengreen and Sachs (1985); Romer (1992).

[28] Cross-sectional reduced form analysis of the impact of devaluation on recovery was provided by Campa (1990) following Eichengreen and Sachs (1985). Other studies in this vein can be found in Bernanke (1995) and

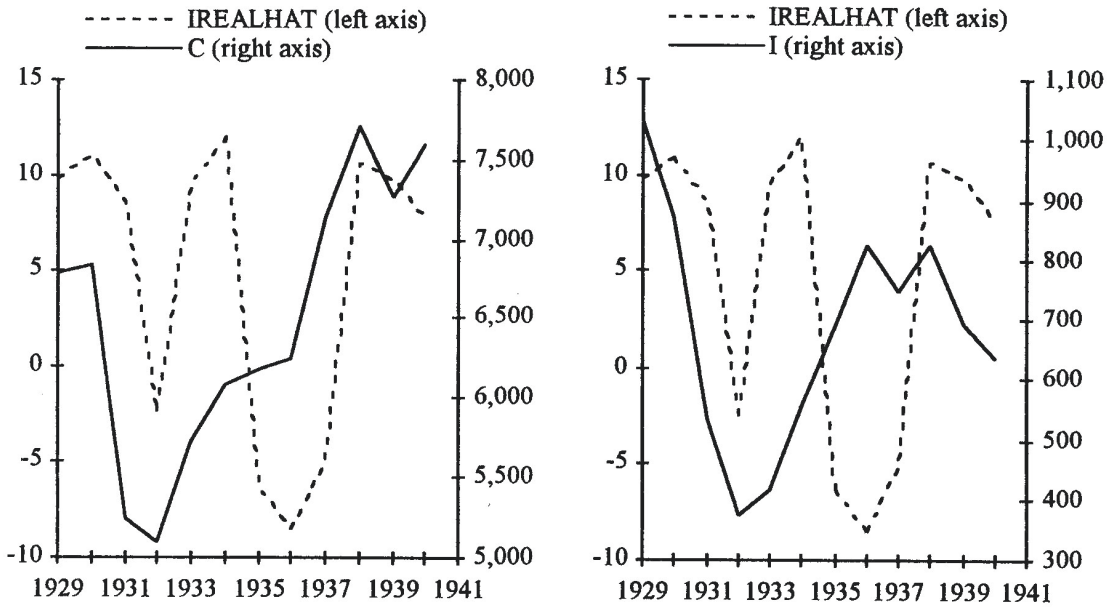
movement is attributable to the reversal of deflationary expectations; at the same moment, consumption and investment began to recover, offering more evidence in favor of a "Mundell effect" interpretation.

Economic Ideas and Economic Policy

A remarkable distinction for the Argentine economy and policymakers in the 1930s was the speed with which the deflation trap was spotted and corrective action taken to avert a calamitous economic collapse. The actions of the Conversion Office in the Spring of 1931 came far in advance of heterodoxy in the core: the regime switch predated the British departure from gold by a good six months, and U.S. interventions by almost two years. Led by Prebisch, policymakers understood very early on in the Depression the need to impose a change of regime to destroy negative expectations. This can be seen as a manifestation of Sargent's (1983) idea concerning the role of expectations and monetary regime changes. Sargent was thinking of inflationary scenarios primarily, but Temin and Wigmore (1990) showed the relevance of the same idea to the deflationary context of the 1930s. Associated with Mundell (1963), the deflation trap was also emphasized by Fisher (1933) and Keynes (1935), each of whom credited its original exposition to the obscure Argentine thinker Silvio Gesell.

Obstfeld and Taylor (1998). This work is perhaps more ambitious, in that we focus on a single case-study and examine the structural details of monetary policy and transmission.

Figure 7
Real Interest Rates, Consumption, and Investment



Source: See text, Table 4, and Figure 6.

Events in the history of thought and events in economic history were most clearly intertwined in the Argentine experience. Gesell's insight came in the economic crisis that followed an attempt to pursue rigid metallic rules in the 1890s as a prelude to resumption at the 1881 parity. His ideas won the day, and thirty-two years of gold standard orthodoxy by the Conversion Office could not diminish their relevance in times of serious deflation. A major deflation was endured during World War One, as the Conversion Office stuck to its rules, and, suspension aside, left the law of 1914 unused. But the experience was painful: the 1914–19 crisis was the possibly the longest and deepest recession in Argentine history; social unrest and economic suffering left a bitter memory. In this context, the next incipient deflation was not so easily tolerated as the price for orthodoxy. Collective memory was drawn upon as the prospect of a repeat of the recessions of the 1890s and 1914–19 loomed, and the penetrating ideas of Prebisch held sway as those of Gesell had a generation before.

Argentina was a peripheral player in the gold standard, and was arguably penalized for being outside of the more credible core group (Bordo and Rockoff 1994). These penalties took the form of higher country risk and reflected a perceived risk of suspension. But in crisis, the less rigid adherence to old orthodoxy served Argentina well. Experience with a fiduciary regime, and a previous suspension, in the 1890s, provided a model of how economic recovery and the maintenance of par might be at odds. The

amendments to the rules of the Conversion Office in the 1914 law provided the formal mechanism for this learning experience to be incorporated into the institutional structure as a tool for use by future technocrats such as Prebisch.

Plus ça change...

In summing up, though, excessive optimism concerning the change of regime should be avoided in our story, as surely such exuberance over the efficacy of monetary policy in the 1930s and 1940s was followed, in the long run, by rather too much reliance on expansionary monetary policy in subsequent Argentine history. The same could also be said of other Latin American countries that discovered the temporary and deflation-specific benefits of monetary expansion in the 1930s (Díaz Alejandro 1983; Campa 1990). Though monetary expansion had delivered rapid recovery from the Great depression, policymakers later seemed unaware that there might be too much of a good thing. The repeated appeal to monetary expansion in the postwar period delivered not improved macroeconomic performance, but ever higher levels of inflation, culminating in hyperinflations in many countries, and a need for exactly the opposite kind of regime shift a la Sargent (1983). The shift eventually came to Argentina in an all too familiar form.

In 1991 a return to a currency-board rule was instigated in Argentina, with much popular support, after all patience had been exhausted with the previous sixty years of floating exchange rates and persistent, often wild, inflations. The current Convertibility Law puts Argentina on a dollar-standard rule very similar to, and in some ways stricter than, the gold-standard mechanism used at the Conversion Office from 1900 to 1931. In search of the *Belle Époque* again, policymakers and the public turned back to the same monetary regime that coexisted with the rapid rates of economic growth seen in the late nineteenth and early twentieth centuries. And, apart from one tough recession, economic performance has been impressive in the last few years. Though little else would be familiar, one might imagine that a visitor arriving from the 1880s, or 1900s or 1920s, would feel very much at home with today's dollar-peso rule. Yet knowing as they did the pitfalls of a metallic regime, and the crises of the 1890s, 1910s, and 1930s, one cannot be very sure that Silvio Gesell or Raúl Prebisch would so comfortably travel back to the future.

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